DCS800 for Positioning Steel Plates in a Slitter Shear

FACT FILE

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Case notes

DCS800 DC Drive operates with a second encoder to improve the accuracy of material positioning.

Problem

DanSteel A/S in Federiksveark, is an important steel manufacturer in Denmark.
DanSteel A/S can produce steel plates from 6 to 100 mm thick, 3250 mm wide and up to 20 metres long for:

- Structural Steel
- Shipbuilding Steel
- Steel for Boilers and Pressure Vessels etc.

The majority of the plates first have to be cut on both sides in the double shear before being cut to the final length.
The production line has a slitting shear. The positioning is made by four pinch rolls. The original configuration had problems positioning thin material (< 8 mm) in the shear.

The customer made an inquiry to ABB service in Denmark to improve the process and make positioning more accurate.

Solution

ABB service tested three different control configurations

1. Second drive received speed reference as speed follower via master follower link (speed follower).
2. First drive received a speed feedback (encoder) of second drive in parallel. First drive was equipped with position controller. Output was sent as speed correction to both speed controllers.
3. In addition to its own motor feedback, both drives received speed feedback (encoder) from the other motor. Both drives were equipped with a position controller.

The third solution gave the best result and satisfied the customer's requirements. ABB service had used two important features in DCS800, which enable full scale position control.
DCS800 has one on-board encoder interface. A second encoder interface RTAC module can be added. Such modules may be used in different applications like shared motion for cranes or for position control.
There are two types of RTAC modules:

- RTAC01 for 24 V and 15 V encoders
- RTAC03 for 24V and 5V encoders

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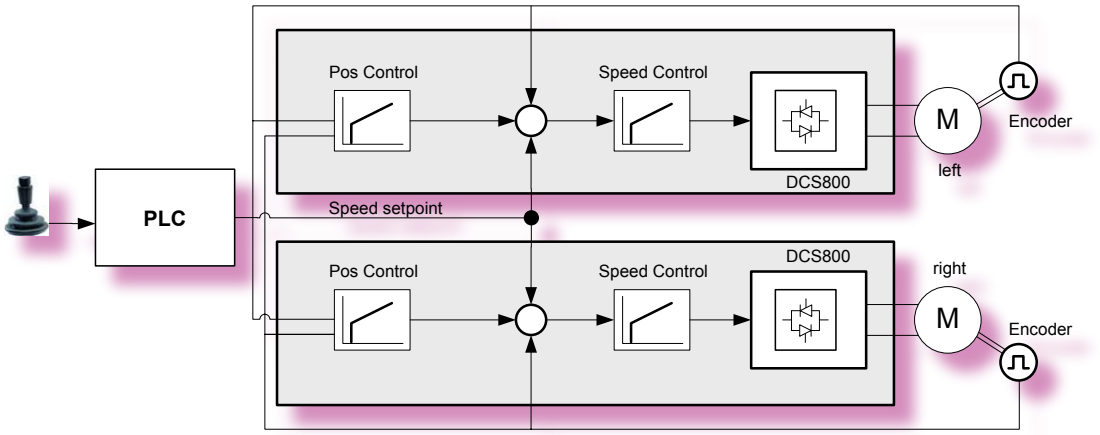


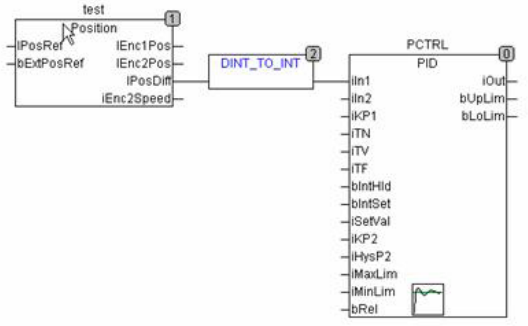
Principle control structure of configuration 3

Another important DCS800 feature is CoDeSys programming

The speed feedback and position feedback of both encoders are made available by the basic firmware, but position difference is calculated by a (IEC61131) function block

Position1- Position2

This subtraction is the most difficult part. With this block it is very simple to built a position control. The library provides a ready made PID controller. The control cycle can be added with a 5ms cycle time.



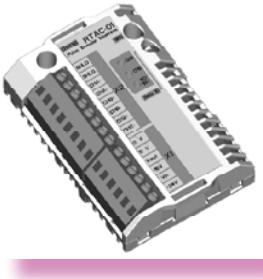
Scope of delivery

The pinch roll drives were upgraded to 4 x:

- DCS800-S02-0200-04
  (Motor data 82 A - 400V)

Benefits

- DCS800 replaces original drive.
- Higher performance and higher accuracy in production is achieved.
- No additional PLC for position control required.
- DCS800 flexible Codesys IEC61131 programming is utilized to create a unique solution.



RTAC encoder module

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